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(54) Title: **METHOD AND SYSTEM FOR OPERATING AN AMUSEMENT PARK**

(57) Abstract: An amusement or other park includes a radio frequency network having a plurality of long range and short range transceivers. The long range transceivers are geographically dispersed throughout the park. The short-range transceivers are located at transaction points within the park. The long-range transceivers are each operable to communicate with radio tags worn by persons in the park at long range. The short-range transceivers are each operable to communicate with radio tags at a short range. A park control system is coupled to the radio frequency network to receive from the long-range transceivers a long range response transmitted by a radio tag and to receive from the short-range transceivers a short range response transmitted by the radio tag and including a transaction having an identifier of the tag and an event associated with the tag. The park control system is operable to determine a location of the tag based on the long-range responses and to post a transaction to an account associated with the tag based on a financial transaction including the identifier of the tag and an amount.

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## METHOD AND SYSTEM FOR OPERATING AN AMUSEMENT PARK

TECHNICAL FIELD OF THE INVENTION

The present invention relates generally to the field of park management and more particularly to a method and system for operating an amusement park.

5

BACKGROUND OF THE INVENTION

Amusement and other entertainment parks are typically confronted with a large number of logistical challenges in their day-to-day operations. The parks must process admissions, handle financial transactions, promote services in the parks, and perform crowd control, all while trying to create a hassle free and enjoyable experience for visitors. Parks must also provide for the safety of young children that become separated from their parents and for young teenage children that may be left alone at the park for the day.

In addition to the day-to-day challenges, parks must also continuously adapt their rides and services to follow public trends and keep public interest in the park. Such adaptations include providing popular shows to attract crowds, updating technology to increase the excitement of existing rides and replacing outdated services with newer technologies such as virtual reality.

Visitors to these parks are also typically confronted with a number of challenges. These visitors often face long lines to gain admission to the parks, long lines to visit the park attractions, and an ever-present risk of theft of the visitors' money and

possessions. These detractions from the park experience may keep potential visitors away from the park and reduce park revenues.

## 5 SUMMARY OF THE INVENTION

The present invention provides an improved method and system for operating an amusement or other entertainment park that substantially reduces or  
10 eliminates the problems and disadvantages associated with previously developed systems and methods. In particular, the present invention integrates wireless identification, web-based technology, and other related technologies to provide scheduling, locating, cash-less payment,  
15 interactive experiences, and other value-added transactions and services that automate park operations and enhance the enjoyment of park attractions for visitors.

In accordance with one embodiment of the present  
20 invention, an amusement or other park includes a radio frequency network having a plurality of long-range and short-range transceivers. The long-range transceivers are geographically dispersed throughout the park. The short-range transceivers are located at transaction  
25 points within the park. The long-range transceivers are each operable to communicate with radio tags worn by persons in the park at a long range. The short-range transceivers are each operable to communicate with radio tags at a short range. A park control system is coupled  
30 to the radio frequency network to receive from the long-range transceivers a long-range response transmitted by a radio tag and to receive from the short-range

transceivers a short-range response transmitted by the radio tag and including a transaction having an identifier of the tag and an event associated with the tag. The park control system is operable to determine a location of the tag based on the long-range responses. The park management system is further operable to post financial transactions to an account associated with the tag based on a financial transaction including the identifier of the tag and an amount.

More specifically, in accordance with a particular embodiment of the present invention, the park management system may be operable to monitor the movements of visitors within the park, verify the visitor's use of attractions, and to provide a schedule for attendance at attractions. For scheduling functionality, the park management system may generate an itinerary route map for visitors based on their schedule and may be connected to the Internet to allow visitors to determine their schedule prior to their visit or before entering the park. In addition, the park management system may generate user profiles based on scheduling and other information for marketing purposes.

In accordance with another aspect of the present invention, an interactive play device includes a receiver operable to receive an identifier from a radio tag. A controller is operable to be set a play mode for the wearer of the radio tag based on the identifier and to activate the device in the play mode. The controller may further retrieve a previous play mode and state of the previous play mode and activate in that play mode and state to pick up activity at the attraction from the

point where the user previously left off. In accordance with yet another aspect of the present invention, a method and system for providing access to an attraction at a park includes storing a schedule for visitors to the park. Each schedule is associated with a visitor and includes a list of attractions to be accessed by the visitor and a time of attendance for each of the attractions. From visitors awaiting access to an attraction, those visitors scheduled for the attraction at a current time are identified and provided with priority access to the attraction.

In accordance with still another aspect of the present invention, a radio frequency tag for use at the park includes a wristband for ease of use with the tag. A dual frequency transceiver is attached to the wristband and operable to communicate at a first frequency over a long range for location purposes and at a second frequency over only a short range for cash-less payment and other controlled transactions. A tag controller is operable to switch to an active state and to actively transmit a signal in that state in response to receiving a location request.

Technical advantages of the present invention include providing a method and system that automates many aspects of park operations. By automating services such as admissions, food purchases, and souvenir purchases, the owners and operators of the parks can provide services to the visitors quickly and more efficiently. This also enables the visitors to use these services more easily.

Another technical advantage of the present invention includes providing a method and system that allows visitors to pre-pay for admissions and to pay for goods and services with a cash-less payment service. This helps reduce the risk of theft of a visitors' possessions by reducing the need of the visitors to carry large amounts of cash or credit cards.

Yet another technical advantage of the present invention includes the provision of scheduling and automated queuing services for rides and services at the park. In particular, visitors may plan their visit to the park, make reservations, and register for in-park services. This allows the visitors to spend less time waiting in lines and gives them more time to visit other park attractions.

Still another technical advantage of the present invention includes providing wireless location and tracking information for visitors at the park. In particular, radio frequency identification (RFID) tags are used in connection with a transceiver network to monitor and/or track the location of visitors, to find lost visitors, and to communicate with visitors should a situation affecting the visitor arise. The RFID tags may also be used for cash-less transactions and to engage interactive play devices in the park.

Still another technical advantage of the present invention includes providing an improved RFID tag for visitors at a park. In particular, the tag may include a dual frequency transceiver to support low-range communication for point-of-sale and other identity verification operations and long-range communications for

monitoring and location services. In addition, the RFID tag may be waterproofed and provided on a wristband for convenience to visitors at the park. The tag may also include pager functionality or enunciators to enhance the versatility of services that can be provided in connection with tag.

Still another technical advantage of the present invention includes providing improved interactive play devices. In particular, robotic, virtual reality, and other play devices may change operational modes based on an age or other characteristic of a user and previous interactions with the user. As a result, the interactive devices may operate differently each time it is used by a visitor to maintain public interest.

Other technical advantages of the present invention will be readily apparent to one skilled in the art from the attached figures, description, and claims.

#### BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention and the advantages thereof, reference is now made to the following descriptions taken in connection with the accompanying drawings, in which:

FIGURE 1 is a block diagram illustrating an entertainment park in accordance with one embodiment of the present invention;

FIGURE 2 is a block diagram illustrating an exemplary scheduling and provisioning system of FIGURE 1 constructed in accordance with one embodiment of the present invention; and

FIGURE 3 is a block diagram illustrating the network communication system of FIGURE 2 constructed in accordance with one embodiment of the present invention.

5 DETAILED DESCRIPTION OF THE INVENTION

FIGURE 1 illustrates a park 10 in accordance with one embodiment of the present invention. In this embodiment, the park 10 is an amusement park. It will be understood that the present invention may be used in  
10 connection with any other suitable type of park providing entertainment services or attractions for visitors. As used herein, the term "park" refers to any amusement park, water park, recreational park, family fun center, attraction, fair, event or other venue, private or  
15 public, where people go for amusement and entertainment.

Referring to FIGURE 1, the amusement park 10 includes an admission booth 12 and an admission kiosk 14 outside a main area of the park 10. At the admission booth 12 or kiosk 14, a visitor may obtain a wireless  
20 identification tag for accessing attractions and services within the park 10. The wireless identification tags may be radio frequency identification (RFID) or other suitable devices capable of identifying the wearer to readers within the park 10.

25 In a particular embodiment, the RFID tags may be implemented on a wristband that can be readily worn and used by a visitor. In this embodiment, the RFID tag may be a multiple frequency tag capable of communicating with different types of readers. For example, the RFID tag  
30 may communicate at a short-range frequency for point of



sale transactions and communicate at a long-range frequency for location and tracking communications.

A main gate 16 provides access to the park interior. The park interior includes a number of attractions 20, one or more restaurants or food stands 22, one or more stores 24, an interactive play device 26, an autophoto device 28, and a control center 30.

The attractions 20 include rides, shows, games, events, and other suitable types of entertainment. In the illustrated embodiment, the attractions include a roller coaster 40, a virtual reality center 42, a water ride 44, an arcade 46, and a concert 48. Access to the roller coaster 40, the virtual reality center 42, and the water ride 44 may be included in the price of admission to the park 10 while the arcade 46 games and the concert 48 may require extra fees.

The integrated play device 26 includes robotics that are operable to interact with a visitor. To provide amusement and entertainment for visitors of different ages and backgrounds, the interactive play device 26 includes a number of operational modes, which are separately set for each user. For example, in an embodiment in which the interactive play device 26 is a robotic animal, the animal may say simple phrases and perform gentle movements for a young child, while the device may react quickly and threateningly to a teenager to provide excitement. As described in more detail below, the type of person interacting with the device 26 may be determined based on the radio frequency identification band worn by the visitor.

The autophoto device 26 may include a digital camera strategically located in the park 10. Visitors may use the autophoto device 28 to have their photo taken and later reclaim the photo at the park entrance, the admission booth 12, or the kiosk 14. In addition, the visitor may later reclaim pictures and other data electronically over the Internet and make payment electronically.

The control center 30 includes one or more computers for operating and controlling the attractions and services at the park 10. As described in more detail below, the control center 30 may connect to a network of transceivers to provide services within the park 10 and to the Internet to allow visitors to view park information and plan a visit to the park.

The network of transceivers may include one or more types of transceivers for identifying visitors based on their RFID band. This allows users to be located within the park 10 and to engage in cash-less transactions in the park 10. As a result, the risk of theft is minimized and lost children and other individuals being sought may be quickly located and found within the park 10. In addition, the use of the RFID band for transactions allows parents to place limits on the types of transactions the children may conduct in the park 10 and generate alarms if a child expected to be within the park 10 leaves the park before a specified time.

In the illustrated embodiment, the transceiver network includes a plurality of long range transceivers (LRT) 60 and a plurality of short-range transceivers (SRT) 62. The transceivers include both transmitters

and receivers. The transmitters and receivers may be integrated or discrete and may be shared. For example, this method may be used for a number of receivers, or readers.

5       The LRT 60 transmit activation signals and receive long-range responses from tags within a large operational area 64. The LRT 60 are distributed throughout the park 10 and preferably to provide complete coverage within the park 10. As described in more detail below, the LRT 60  
10 are used to locate and track visitors within the park 60 based on information received from their RFID bands.

      The SRT 62 are used at the attractions 20 to confirm that a visitor has engaged in the provided activity. The use of the SRT 62 may be combined with video images to  
15 provide further confirmation of visitor activities. At attractions such as a concert 48 requiring additional fees, the SRT 62 may be used by a visitor to approve a charge against a previously established account or identified credit card account. Similarly, the user may  
20 use his or her RFID band to approve charges his or her account accrued at the restaurant 22, store 24, autophoto device 28, or any other point of sale. SRT 62 may also be provided at the entrance 16 to track the ingress and egress of visitors into and from the park 10. At the  
25 integrated play device 26, the SRT 62 may enable classification of users based on information obtained from their RFID bands.

      FIGURE 2 is a block diagram illustrating an embodiment of a park control system in the control center  
30 of FIGURE 1 in accordance with one embodiment of the present invention. In the illustrated embodiment, the

park control system comprises a scheduling and provisioning control system 90 having a gateway 100, a park services control system 102, a park management control system 104, and a network communication control system 106.

Gateway 100 is coupled to park services control system 102, and gateway 100 is operable to allow visitors and/or park owners and operators to gain access to park services control system 102. Gateway 100 may, for example, comprise an Internet web site. Gateway 100 may be coupled to Internet 108 using any standard Internet connection, allowing visitors and park owners and operators to access park services control system 102 from any location having Internet access, including a home, an office, travel agencies, hotels, kiosks located at or near the park, or a portable computing devices. Gateway 100 may also be linked with related Internet sites, such as park web sites 110, to support promotional tie-ins and facilitate easy access to other helpful information related to planning a visit to the park.

Park services control system 102 allows visitors to access useful information about the park, schedule their time at the park, pre-pay admissions, make reservations, and/or register for in-park services. In addition, scheduling allows disabled persons to plan their visit and the park to plan dispatch of personnel to assist them and thus ensure compliance with the Americans with Disability Act (ADA). Park services control system 102 may comprise a scheduler 112, which can be accessed by a visitor through gateway 100. Using scheduler 112, visitors may access information through gateway 100 to

pre-plan activities and register for in-park services. Scheduler 112 may, for example, provide a graphical user interface comprising a point-and-click park map, allowing a visitor to select various attractions in the park and  
5 view information about those attractions. Scheduler 112 may also be operable to display information from park web sites 110.

Scheduler 112 may also provide a table of times, places, and activities, which a visitor may use to create  
10 a pre-planned, personal itinerary. Scheduler 112 may use the itinerary to create a personalized route map superimposed over the park site map, showing the visitor the itinerary in graphical form. Scheduler 112 may further produce a detailed itinerary that can be printed  
15 by a visitor.

In operation, scheduler 112 promotes and receives selections of services, provides previews and receives selections of rides and other attractions, requests and receives selections of times, verifies availability and  
20 alternate times, and adds queue times and locations to the itinerary. In addition, scheduler 112 links to the park services system for registration and fee payment.

In addition, scheduler 112 may automatically log and approve reservations for restaurants, events, and rides  
25 based upon availability and allocation information provided by the park. Scheduler 112 may also provide for the promotion of and pre-enrollment of in-park services. For example, scheduler 112 may provide a visitor with a list of all in-park services available, and the visitor  
30 may view information about each service. Scheduler 112 then allows the visitor to enroll in services that the

visitor selects. Tie-ins for the scheduler 112 include loyalty/promotion programs that link to park and cross promotion information sites. In addition, scheduler may link to the park services system for season pass or  
5 program registration and fee payment.

Scheduler 112 may comprise any hardware, software, firmware, or any combination thereof operable to display information to a visitor and allow the visitor to select in-park services. Schedule 112 may, for example,  
10 comprise a dedicated server or site host with graphical user interface-based interactive software.

Park services control system 102 may also include an account manager 130. After a visitor selects to pre-pay fees and/or pre-enroll for in-park services through  
15 scheduler 112, manager 130 pre-registers the visitor. Manager 130 gathers information to create a guest profile with information about the visitor and assigns a unique account number to the profile. Manager 130 may also perform a service enrollment gathering information needed  
20 to enroll the guest for one or more in-park services. Manager 130 may further perform a credit authorization. In one embodiment, manager 130 may communicate with one or more credit card services 132 to pre-authorize spending levels, collect payments, and handle billing.  
25 In another embodiment, visitors may make a deposit using cash, a credit card, or a bank card, and manager 130 treats purchases as debits against the deposited balance. In addition, visitors and park owners and operators may access manager 130 through gateway 100 to review and/or  
30 audit activity logs and transactions.

Manager 130 routes new and updated guest profiles to park management control system 104, and manager receives purchase information and other in-park usage information, location information, and transaction information for each guest from park management control system 104. Manager 130 may comprise any hardware, software, firmware, or any combination thereof operable to create and/or store guest profiles and store and/or retrieve account information. Manager 130 may, for example, comprise a relational database operable to store and/or retrieve guest profiles and account information using the account number as a common key. Individual, family, and group identifiers may be used to link individual profiles together.

Park services control system 102 may be further operable to sort and report anonymous account information for market research, demographic data, and cross-promotion validation. Park owners and operators may use park services control system 102 to determine the types of people visiting their parks, the services the visitors are using, the products that the visitors are buying in the park, and the rides, attractions, and/or areas most frequented by visitors to the park.

Control system 30 may provide a large number of various in-park services. Control system 30 may, for example, provide a cash-less payment service 114, an automated queuing service 116, an account management service 118, a locator service 120, an activity monitor service 122, an interactive play service 124, an automated photography service 126, and a communicator service 128. Other services may be provided by control

system 30 without departing from the scope of the present invention.

Cash-less payment service 114 provides visitors and park employees with a secure, cash-less system for paying  
5 for goods and services at different points-of-sale inside the park. The benefits to the park operator of the cash-less point-of-sale service and the other services include new promotional opportunities, reduced cash shrinkage, reduce liability, improved load-leveling, increased  
10 productivity, higher per-guest spending rate, enhanced park-wide visibility, and accumulation of demographic data.

In one embodiment, each visitor and employee receives a wrist band (explained in greater detail in  
15 FIGURE 3) comprising a processor and a radio frequency communication circuit. The wristband communicates with an antenna at a point-of-sale, identifying the visitor or employee making a purchase. The purchaser's information is transmitted to park management control system 304 for  
20 transfer to manager 130, where manager 130 charges the purchase against the purchaser's account. Tie-ins for cash-less payment service 114 include season pass including providing bands and packages and control access as well as loyalty programs that uses promotions and data  
25 gathered on preferences and habits to underwrite costs and expand utilization of services.

In a particular embodiment, dispensing a return of the wristbands may be automated using an ATM-style station such as the kiosk 14. In this embodiment, the  
30 kiosk 14 is interfaced to the park services system using the Internet, may accept cash, credit cards, or bank



cards, automatically set up an account link to the band and then automatically dispenses the band for use. A return slot is provided that reads the band, adjusts and closes the account, and refunds unused cash or credit plus deposit.

Automatic queuing service 116 allows visitors to request a queue time for admissions, a ride, an attraction, an event, or a meal. A guest may visit scheduler 112 through gateway 100 and establish an itinerary. The guest may request that he or she be allowed to perform an activity at a preferred time. Automatic queuing service 116 allocates a number of time slots for a certain time period, such as 15 or 30 minutes, on a first-come, first-serve basis. In one embodiment, a visitor uses a wristband that communicates with an antenna near an attraction. Park management control system 104 receives the visitor's information and confirms whether the visitor is at the correct attraction within the right queue slot. If so, the visitor may gain access to the attraction. In addition, automated queuing service 116 may transmit a notification to a guest's wristband or other device, reminding the guest of an approaching event.

Automatic queuing service 116 increases park revenues by creating more opportunities for guests to spend more money for food, merchandise, and the like. The automatic queuing may be expanded for automated reservation services for special events, premier attractions, meals and the like. Tie-ins for automatic queuing service 116 include season pass, and includes the band in a package and control access and loyalty programs

that use data gathered on preferences and habits to underwrite costs and expand utilization. In addition, promotions may be targeted based on ride and event demographics.

5 Account management service 118 monitors the activities and spending of the guests and employees. Account management service 118 may also restrict access and spending authorizations according to predetermined parameters. For example, account management system 118  
10 allows parents to establish access and spending limits in a park for their children, limiting the amount of money the children can spend and the attractions the children may visit. Account management system 118 may also restrict access based on a particular event, by category  
15 of attraction, by time, and/or by amount. Account management system 118 may further log all activities of the children while in the park. Tie-ins for account management service 18 include season pass that promotes a premium-tier pass for children and teens and loyalty  
20 programs that uses data gathered on preferences and habits to underwrite costs and expand utilization, as well as target promotions based on ride and event demographics.

Locator service 120 provides a tracking function to  
25 help locate individuals, employees, groups, and/or park assets within a park. For example, locator service 120 may provide a verification that a child remains on the park's premises. In one embodiment, a wristband or other device communicates with a park-wide fixed transceiver  
30 network operable to track the wristband or device anywhere in the park. The fixed transceiver network may,

for example, routinely poll the wristband or device to locate a person or asset and ensure that the person or asset stays within the park. Also, as a security measure, the wristband or other device may be equipped with a tamper detection unit and alarm. Further, the wristband or device may include a user-activated distress alarm and a search notification function alerting a guest or park employers that a search for that guest is in progress. In addition, locator service 120 may be invoked from a kiosk or other in-park system, allowing visitors to track other members of their group. Locator service 120 may also invoke automated photography service 126 or a television surveillance system to help locate a person or an asset within the park. Tie-ins for locator service 120 include season pass that promotes a premium-tier pass for children and teens as well as groups and loyalty programs that associate brand with child safety by promoting and underwriting the service. Data gathered on preferences and habits may be used to underwrite the cost and expand utilization.

Activity monitor service 122 logs and reports spending, transaction, and activity data for an individual guest or employee, a family, or a group. Activity monitor service 122 may provide purchase information, transactional information, service use, and event data to validate account charges for each guest. Activity monitor service 122 may also display and/or report lists of daily activities and transactions to a guest through gateway 100, allowing the guest to confirm expenses after leaving the park. Further, activity monitor service 122 may invoke automated photography

service 126 or a television surveillance system as an additional security measure. Tie-ins for activity monitor service 122 include locator service to gather evidentiary data for park liability, season pass in which  
5 a service is promoted as a value-added service for pass holders and loyalty programs in which data gathered on preferences and habits used to underwrite the cost and expand utilization of the service. In addition, promotions may be targeted based on purchase, ride, and  
10 event demographics.

Interactive play service 124 facilitates automatic identification of a guest, allowing the guest to interact with play stations, games, rides, displays, and attractions in a personalized way. Interactive play  
15 system 124 may use personalized responses collected when manager 130 created a user profile in order to facilitate the interactive activities. Interactive play service 124 may be enhanced with the use of activation and response buttons on devices. Tie-ins for interactive play service  
20 124 include season pass in which a service is promoted as a premium service for pass holders and loyalty programs which use data gathered on preferences and habits to underwrite costs and expand utilization. Different interactive play services may be cross-promoted and links  
25 may be provided based on interactive ride, event, and merchandise demographics.

Automated photography service 126 facilitates automatic identification of a guest to activate an automated camera or image capture system. The images may  
30 be printed photographs or electronic versions. Guests to a park may obtain a visual record of their visit to the

park without the need to carry a camera. Guests may later review the pictures through a kiosk at or near the park or through gateway 100 and order copies of the photographs. In another embodiment, guests may use an  
5 activation button that communicates with automated photography unit 126 to trigger a camera. Specific cameras may be customized for different types of image capture systems. Tie-ins for automated photography unit 126 include season pass in which the service is promoted  
10 as a premium service for pass holders and loyalty programs which use data and images gathered on preferences and habits to underwrite the cost and expand utilization. Cross-promotion may also be provided with links based on photo and image demographics.

15 The automated photography service 126 may also include surveillance cameras, image, infrared, and other video devices and other image capture devices. These devices and systems may be implemented and operated in accordance with U.S. Patent No. 4,857,991 entitled  
20 "Method and System for Decompressing Color Video Feature Encoded Data", U.S. Patent No. 4,816,901 entitled "Method and System for Compressing Color Video Data", U.S. Patent No. 4,843,466 entitled "Method and System for Decompressing Color Video Slope Encoded Data", U.S.  
25 Patent No. 4,849,807 entitled "Method and System for Compressing Color Video Feature Encoded Data", U.S. Patent No. 4,847,677 entitled "Video Telecommunication System and Method for Compressing and Decompressing Digital Color Video Data", U.S. Patent No. 4,857,993  
30 entitled "Method and System for Decompressing Digital Color Video Statistically Encoded Data", U.S. Patent No.

4,914,508 entitled "Method and System for Compressing and Statistically Encoding Color Video Data", U.S. Patent No. 5,140,142 entitled "Method for Color Encoding and Pixelization for Image Reconstruction", U.S. Patent Application Serial No. 07/611,142 entitled "Data Processing Apparatus and Method Using Data Compression (Delta)", U.S. Patent Application Serial No. \_\_\_\_\_ filed on March 20, 1998 entitled "Conditional Update Method for Video Compression", U.S. Patent Application Serial No. \_\_\_\_\_ filed March 20, 1998 entitled "Video Compressed Apparatus and Method, and U.S. Patent Application Serial No. 08/610,618 which are all hereby incorporated by reference.

Communicator service 128 provides in-park digital and/or audio communications to guests and employees. In one embodiment, guests may send or receive messages through user-supplied or rented pagers or wireless phones. In another embodiment, guest wristbands may include a text or message display. The pagers, wireless phones, or wristbands may also include a response button informing a sender that the message was received. Communicator service 128 may be used, for example, to send service alerts to guests, informing the guests that it is time to leave the park or rendezvous with a group or a family. Tie-ins for automatic photography unit 126 include season pass in which a service is promoted as a premium service for pass holders and loyalty programs in which data gathered on preferences and habits are used to underwrite costs and expand utilization. Cross-promotion may be provided with links based on cell and pager demographics.

Park management control system 104 provides an on-site interface between park services control system 102 and in-park systems. Park management control system 104 communicates with network communication control system 106, and park management control system 104 may also communicate with other in-park systems such as admissions, point-of-sale, and access control.

Park management control system 104 may comprise a database operable to store active guest profiles that are maintained and updated daily. The database may also store short list tables of valid network identifiers for the in-park services. Using the stored information, park management control system 104 may quickly provide authorization for any transaction. Park management control system 104 also uses the database to record account activity for later transmission to park services control system 102. Park management control system 304 stores and transmits purchase information and other in-park usage information, location information, and transaction information to manager 130.

To support locator service 120, park management control system 104 also supports at least one local terminal where park personnel can initiate a search query. A search query may cause park management control system 104 to display the daily activity log of a guest stored in the database in park management control system 104. A search query may also cause network communication control system 106 to poll the entire park to locate a responsive signal from the guest, employee, an employee wristband, or asset's wristband or other device. If a response is received, park management control system 104

may display the location of the guest or park asset in a park site map.

Network communication control system 106 communicates with the wristbands or other devices used in scheduling and provisioning control system 30. An exemplary embodiment of network communication control system 306 is shown in FIGURE 3, which is now described.

FIGURE 3 is a block diagram illustrating an exemplary network communication control system 106 of FIGURE 2 constructed in accordance with the teachings of the present invention. In the illustrated embodiment, network communication control system 306 comprises wrist bands 196 and 198, fixed network transceivers 200, 204, 206, and 208, a short range antenna pad 202, a low frequency activation loop antenna 206, and a local area network (LAN) 212.

Wristbands 196, 198 are personal wireless communicators that are operable to communicate with one or more fixed network transceivers 200, 204, 206, and/or 208. The bands can be dispensed to guests at the admissions office or ticket counter, or if time permits, shipped directly to the guest prior to visiting the park. The bands can also be automatically dispensed through the service enrollment kiosk 14 at the park.

Each wristband 196, 198 contains a processor integrated with a radio frequency communication circuit capable of sending and/or receiving signal messages to and from fixed network transceivers 200, 204, 206, and/or 208. The processor is programmed with a unique identifier linked to a guest's account. The processor may also be programmed with a set of command logic that allows wrist



band 196, 198 to act on messages received from fixed network transceivers 200, 204, 206, and/or 208 and respond to commands according to the programmed logic.

Wristband 196 comprises a radio frequency communication circuit that uses a single frequency. In the illustrated embodiment, wristband 196 uses a low frequency circuit and has a short range. Wristband 198 comprises a radio frequency communication circuit that uses multiple frequencies, allowing wristband 198 to use both a low and a high frequency for short and long range communications. Wristband 198 may also be configured to operate only at low or high frequencies for implementing a particular service of control system 30. Although the personal communication device in FIGURE 3 is illustrated as wrist bands 196, 198, other communication devices may be used without departing from the scope of the present invention. In a particular embodiment, radio frequency components of the park 10 and the wristbands may be implemented in accordance with systems and tags disclosed in U.S. Application Serial No. 09/298,982 that is entitled "Distributed Tag Reader System and Method", U.S. Application Serial No. 09/357,435 that is entitled "Radio Frequency Identification System and Method", U.S. Application Serial No. 09/298,559 that is entitled "Low Power Receiver for Radio Tag and Method", U.S. Application Serial No. 09/258,974 that is entitled "High Sensity Demodulator for a Radio Tag and Method", U.S. Application Serial No. 08/789,148 entitled "Radio Tag System and Method With Improved Tag Interference Avoidance", U.S. Application Serial No. 09/357,669 entitled "Dual Frequency Radio Tag for Radio Frequency

Identification System, and U.S. Application Serial No. 09/357,688, all of which are incorporated herein by reference.

Wristbands 196, 198 may also contain an audio and/or  
5 visual enunciator that can be activated by a command from  
fixed network transceivers 200, 204, 206, and/or 208.  
The enunciator may be used to page guests to remind them  
of pending events. The enunciator may also be used to  
sound an alarm, for example, to help locate lost children  
10 or signal early exit from the park premises. Wristbands  
196, 198 may further include a tamper detection circuit  
that disables wristband 196, 198 and/or activates the  
audio alarm. The tamper detection circuit could be used,  
for example, to indicate that a wristband 196, 198 has  
15 been removed from a guest's wrist prior to exiting the  
park. When in alarm mode, wristband 196, 198 may  
periodically broadcast its identification to facilitate  
rapid location of the guest or wristband 196, 198.

Each fixed network transceiver 200, 204, 206, and  
20 208 comprises a radio transmitter/receiver, a  
communication interface, and a processor with programmed  
logic. Fixed network transceivers 200, 204, 206, and 208  
may be configured for operations involving different  
distances, or ranges.

25 For short-range operations, a fixed network  
transceiver 200 is configured to operate at low  
frequencies with a corresponding small form-factor  
antenna such as pad antenna 202 attached, thereby  
facilitating greater control over activation and enabling  
30 communication when the wrist band is in close proximity  
of the antenna. Fixed network antenna 200 and pad

antenna 202 may be used to enable network communication control system 306 to communicate with wristband 196. In one embodiment, pad antenna 202 is integrated with an existing point-of-sale terminal or device.

5       For longer-range operations, one or more long range, high frequency fixed network transceivers 204 with omni-directional antenna arrays 205 may be installed around the park. Fixed network transceiver 204 enables long range activation and communication with wristband 198  
10 throughout the park for paging and location applications. The range and coverage of each fixed network transceiver 204 defines an area called a cell, and some cells may overlap. Signals received by one or more fixed network transceivers 204 from wristband 198 may be used to locate  
15 wristband 198. Medium range, high frequency fixed network transceivers 206 may also be used to communicate with wristband 198 over medium distances.

Interactive applications may require a dual frequency fixed network transceiver configuration, using  
20 a combination of low frequency operations for maximum control over the activation zone and high frequency operations for subsequent communication at distances of up to 30 feet or more. In this embodiment, a dual frequency fixed network transceiver 208 with a high  
25 frequency receive antenna 210 may receive the high frequency commands from wristband 198. Fixed network transceiver 208 is also coupled to low frequency activation loop antenna 212, which enables the low frequency operations of wristband 198.

30       Fixed network transceivers 200, 204, 206, and 208 communicate with park management control system 304

through the communication interface and are coupled to park management control system 304 through a communications network 214. Communications network 214 supports information flow between park management control system 304 and fixed network transceivers 200, 204, 206, and 208. In the illustrated embodiment, the communications network 214 comprises a local area network, and the communication interface in fixed network transceivers 200, 204, 206, and 208 comprises a local area network interface. Communications network 214 may comprise a wireline local area network, a wireless local area network, or a combination of both. Communications network 214 may also comprise any number of communications networks, including wide area networks (WAN) and municipal area networks (MAN).

For interactive applications, the dual-frequency FNT configuration provides a combination of low frequency operation for maximum control over the activation zone and high frequency operation for subsequent communication at longer distances. For example, when a guest enters an interactive play facility, the band is activated by a low frequency FNT command signal limited to a specific area or station within the play area. The activation message contains a number indicating the location of the station that activated the band. The band transmits its ID along with the station number at high frequency. A mini-network of long-range high frequency FNT receivers installed around the play facility receive the band signal and forward the data to the interactive play controller. The controller uses this information to customize the interactive play to the guest's profile.

Although the present invention has been described in several embodiments, a myriad of changes, variations, alterations, transformations, and modifications may be suggested to one skilled in the art, and it is intended  
5 that the present invention encompass such changes, variations, alterations, transformations, and modifications as fall within the spirit and scope of the appended claims.

WHAT IS CLAIMED IS:

1. A park, comprising:
  - a radio frequency network;
  - 5 the radio frequency network including a plurality of long-range transceivers geographically dispersed throughout the park and a plurality of short-range transceivers located at transaction points within the park;
  - 10 the long-range transceivers each operable to communicate with radio tags worn by persons in the park at a long range;
  - the short-range transceivers each operable to communicate with the radio tags at a short range; and
  - 15 a park control system coupled to the radio frequency network to receive from the long-range transceivers a long range response transmitted by a radio tag and to receive from the short-range transceivers a short range response transmitted by the radio tag and
  - 20 including a transaction having an identifier of the tag and an event associated with the tag, the park control system operable to determine a location of the tag based on the responses and to post a transaction to an account associated with the tag based on a financial transaction
  - 25 including the identifier of the tag and an amount.

2. The park of Claim 1, further comprising the long-range transceivers communicating with the radio tags at the first frequency and the short-range transceivers communicating with the tags at a disparate second  
5 frequency.

3. The park of Claim 1, further comprising the park control system operable to monitor the movements of the person based on the responses received from the radio  
10 tag.

4. The park of Claim 1, wherein the person is a visitor to the park, further comprising the park control system operable to verify a visitor's use of an attraction based on an attraction transaction including  
15 an identifier of the tag and an attraction identifier.

5. The park of Claim 1, wherein the person is a visitor to the park, further comprising:  
20 an attraction including a short-range transceiver; and

the park control system operable to store a schedule for the visitor, to receive an attraction transaction including the identifier of the tag and an  
25 identifier of the attraction, and to respond with a schedule status for the visitor at the attraction based on the schedule for the visitor.

6. The park of Claim 1, further comprising:  
the radio tag including a two-way communication device; and

5 the park control system further operable to establish a communication session with the person through the radio tag using one or more of the transceivers to communicate with the two-way communication device at the radio tag.

10 7. The park of Claim 1, further comprising:  
a plurality of image capture devices distributed throughout the park; and

the park control system further operable to identify image capture devices in the location of the person for visual location of the person.  
15

8. The park of Claim 7, further comprising the park control system operable to record and store images captured by the image capture devices.  
20

9. The park of Claim 1, wherein the person comprises a visitor to the park, further comprising an interactive play device including at least one transceiver, the interactive play device operable to  
25 determine a characteristic of the visitor based on a radio response received by the transceiver and to set a play mode based on the characteristic of the visitor.



10. The park of Claim 1, wherein the person is a visitor to the park, further comprising an image capture device positioned in the park and including a transceiver operable to receive a response from the radio tag of the visitor, to capture an image upon receiving the response, and to transmit the image to a storage site for later retrieval by the visitor.

11. The park of Claim 11, further comprising the image capture device operable to transmit the image to the park control system along with the identifier of the radio tag for later delivery to the visitor and to transmit a purchase transaction for the photograph.

12. The park of Claim 5, the park control system operable to generate an itinerary route map for the visitor based on the schedule.

13. The park of Claim 1, wherein the person is a visitor to the park, further comprising a scheduler operable to be accessed over a network and to generate the schedule of activity for the visitor based on user input.

14. The park of Claim 13, the scheduler further operable to be accessed over the network to register the visitor for services based on user input.

15. The park of Claim 13, further comprising the park control system operable to generate a visitor profile based on user input into the scheduler.

16. The park of Claim 13, wherein the network is the Internet.

5        17. The park of Claim 13, wherein the network is a local area network at the park.

18. The park of Claim 13, wherein the network is a network extending from the park to one or more local-  
10 businesses.

19. The park of Claim 1, wherein the person is a visitor to the park.

15        20. The park of Claim 1, wherein the person is an employee of the park.

21. The method for operating a park, comprising:  
geographically distributing a plurality of  
long-range transceivers throughout the park;  
locating a plurality of short-range  
5 transceivers at transaction points within the park;  
communicating with radio tags worn by persons  
in the park at long range with the long-range  
transceivers;  
communicating with the radio tags at a short  
10 range with the short-range transceivers;  
receiving from the long-range transceivers a  
long range response transmitted by a radio tag;  
receiving from the short-range transceivers a  
short range response transmitted by the radio tag and  
15 including a transaction having an identifier of the tag  
and an event associated with the tag;  
determining a location of the tag based on the  
long range responses; and  
posting a transaction to an account associated  
20 with the tag based on a financial transaction including  
the identifier of the tag and an amount.

22. The method Claim 21, further comprising:  
the long-range transceivers communicating with  
25 the radio tags at a first frequency; and  
the short-range transceivers communicating with  
the tags at a disparate second frequency.

23. The method of Claim 21, further comprising  
30 monitoring the movements of the person based on the  
responses received from the radio tag.

24. The method of Claim 1, wherein the person is a visitor to the park, further comprising verifying a visitor's use of an attraction based on an attraction transaction including an identifier of the tag and an attraction identifier.

25. The method of Claim 21, wherein the person is a visitor to the park, further comprising:

10           storing a schedule for the visitor;

              receiving an attraction transaction including the identifier of the tag and an identifier of the attraction; and

15           responding with a schedule status for the visitor at the attraction based on the schedule for the visitor.

26. The method of Claim 21, further comprising establishing a communication session with the person through the radio tag using one or more of the transceivers to communicate with a two-way communication device at the radio tag.

27. The method of Claim 21, further comprising:

25           distributing image capture devices throughout the park; and

              identifying image capture devices in the location of the person for visual location of the person.

28. The method of Claim 27, further comprising recording and storing images from the image capture devices.

5        29. The method of Claim 21, wherein the person comprises a visitor to the park, further comprising:

              determining at an interactive play device a characteristic of the visitor based on a radio response received by a transceiver for the interactive play  
10 device; and

              setting a play mode for the interactive play device based on the characteristic of the visitor.

30. The method of Claim 21, wherein the person is a  
15 visitor to the park, further comprising:

              positioning an image capture device in the park;

              receiving a response from the radio tag of the visitor at a transceiver for the image capture device;

20        capturing an image upon receiving the response; and

              transmitting the image to a storage site for later retrieval by the visitor.

25        31. The method of Claim 25, further comprising generating an itinerary route map for the visitor based on the schedule.

32. The method of Claim 21, further comprising  
30 providing remote scheduling services to attractions at the park over a network.

33. The method of Claim 32, wherein the network comprises the Internet.

5        34. The method of Claim 21, wherein the person comprises a visitor.

35. The method of Claim 21, wherein the person comprises an employee of the park.

10

36. A radio frequency tag for use at a park, comprising:

a wristband;

5 a dual frequency transceiver operable to communicate at a first frequency over a long range and at a second frequency over only a short range; and

a controller operable to switch to an active state and actively transmit a signal in response to receiving a request.

10

37. The radio frequency tag of Claim 13, further comprising a visual enunciator operable to be remotely activated to provide information to the wearer.

15 38. The radio tag of Claim 13, further comprising an audio enunciator operable to be remotely activated to provide information to the wearer.

20 39. The radio tag of Claim 13, further comprising a two-way communication device operable to allow a connection to be established between the radio tag and a remote location and the wearer to communicate over the connection.

40. An interactive play device, comprising:

a receiver operable to receive a unique identifier;

a controller operable to set a play mode for  
5 the wearer of the radio tag based on the unique identifier; and

the controller operable to activate the interactive play device in the play mode.

10 41. The interactive play device of Claim 40, the controller further operable to retrieve a previous play mode and state of the previous play mode based on the unique identifier and to activate the interactive play device in the play mode and at the state.

15 42. The interactive play device of Claim 40, further comprising:

the controller operable to determine a classification for a user based on the unique identifier;  
20 and

the controller operable to set the play mode based on the characteristic.

43. The interactive play device of Claim 40,  
25 wherein the receiver is a radio frequency receiver and the radio frequency receiver is operable to receive the unique identifier from a radio tag worn by a user.



44. A method for operating an interactive play device, comprising:

receiving a unique identifier from a user;

5     setting a play mode for the user based on the identifier; and

activating the interactive play device in the play mode.

45. The method of Claim 44, further comprising  
10     retrieving a previous play mode and a state of the previous play mode based on the unique identifier and activating the interactive play device in the play mode and at the state.

15     46. The method of Claim 44, further comprising:  
determining a characteristic of the user based on the unique identifier; and  
setting the play mode for the interactive play device based on the characteristic of the user.

20

47. The method of Claim 44, wherein the unique identifier is received from a radio tag.

48. A method for providing access to an attraction at a park, comprising:

storing a schedule for visitors to the park;  
each schedule associated with a visitor and  
5 including a list of attractions to be accessed by the visitor and a time of attendance for each of the attractions;

from visitors awaiting access to an attraction, identifying those visitors scheduled for the attraction  
10 at a current time; and

providing the scheduled visitors with priority to access the attraction.

49. The method of Claim 48, further comprising  
15 identifying visitors scheduled for the attraction at the current time based on a unique identifier.

50. The method of Claim 49, further comprising:  
providing a radio tag for visitors to the park;  
20 and

identifying the visitors scheduled for the attraction at the current time based on identifiers transmitted from radio tags of the visitors awaiting access to the attraction.

25

51. A visitation planning system comprising:  
a computer-readable medium; and  
software stored on the computer-readable  
medium, the software operable to provide a scheduling  
5 interface to future visitors to a facility, to receive  
scheduling selections for activities at the facility, to  
generate a schedule based on the scheduling selections,  
to provide a services interface, to receive service  
selections for services provided in connection with the  
10 facility, and to register the future visitor for services  
based on the service selections.

52. The visitation planning system of Claim 51,  
further comprising an Internet server executing the  
15 software to provide Internet access to the scheduling and  
server interfaces.

53. The visitation planning system of Claim 51, the  
scheduling interface further operable to provide a site  
20 map of the facility.

54. The visitation planning system of Claim 51, the  
software further operable to provide an itinerary to the  
future visitor based on the schedule.

25

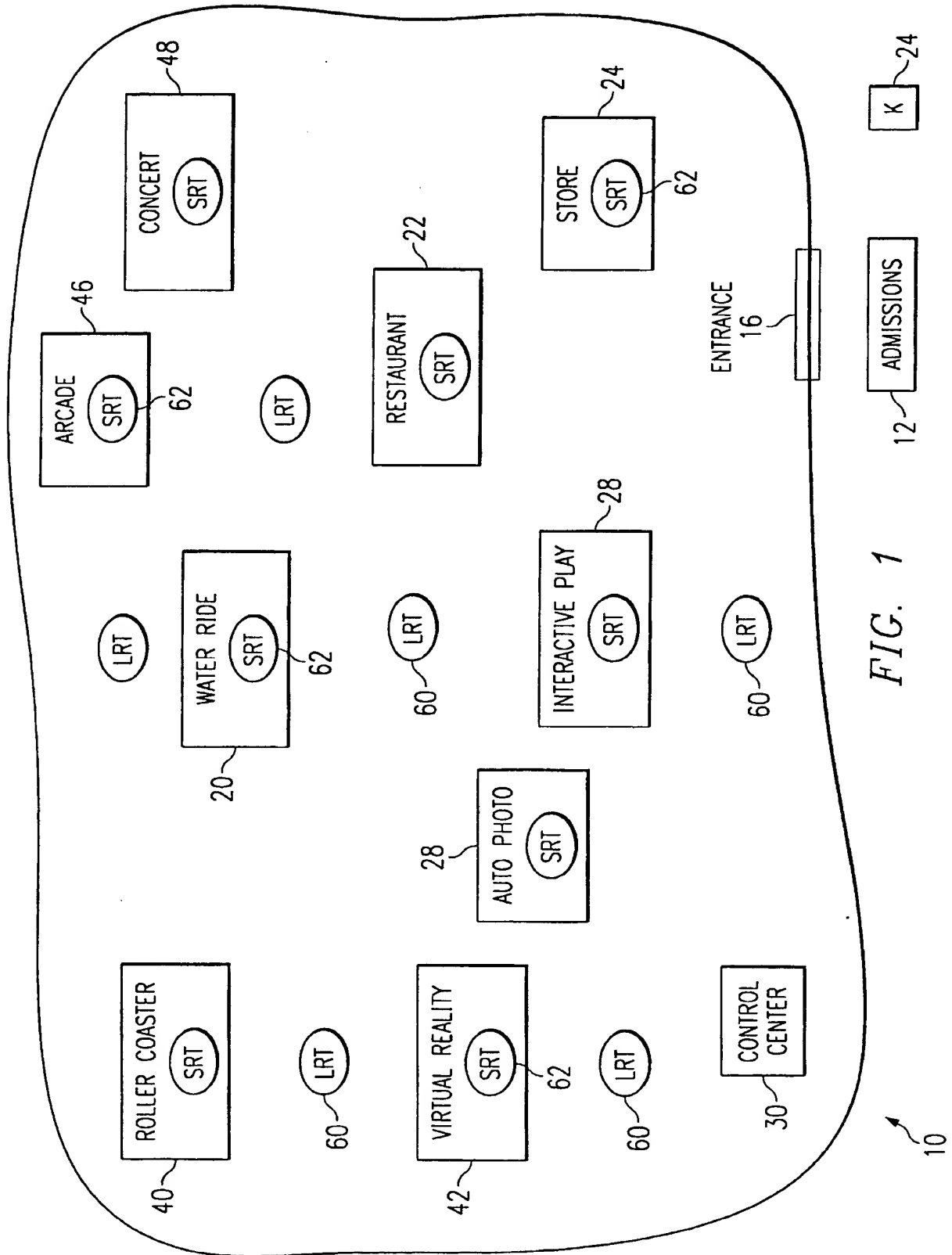
55. The visitation planning system of Claim 51, the  
software further operable to generate a route map of  
scheduled activities at the facility based on the  
schedule.

30

56. The visitation planning system of Claim 51, the software further operable to initiate mailing of a radio frequency tag to the future visitor for paperless admission into and transactions within the facility.

5

57. The visitation planning system of Claim 51, wherein the facility is a park.



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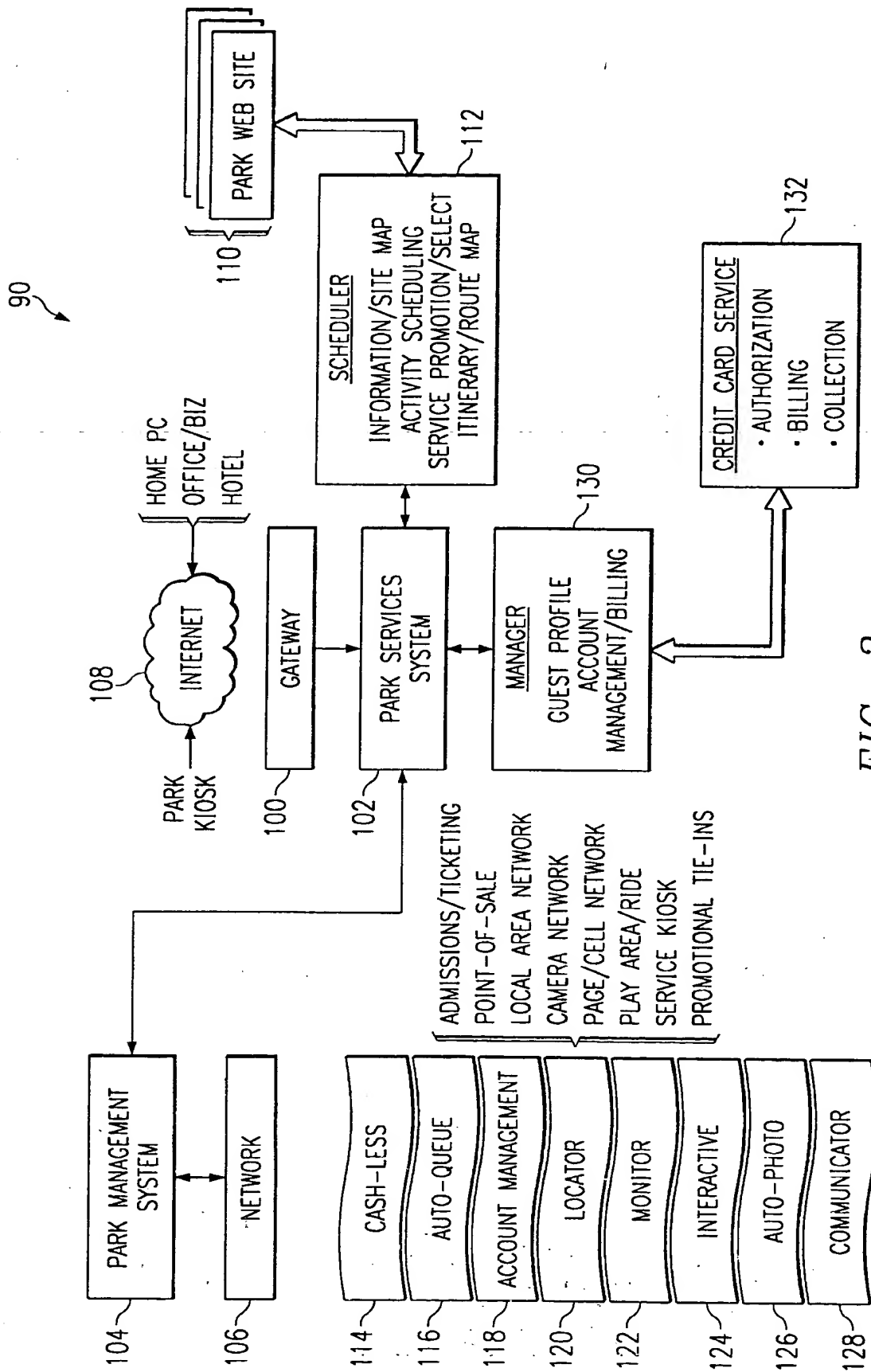
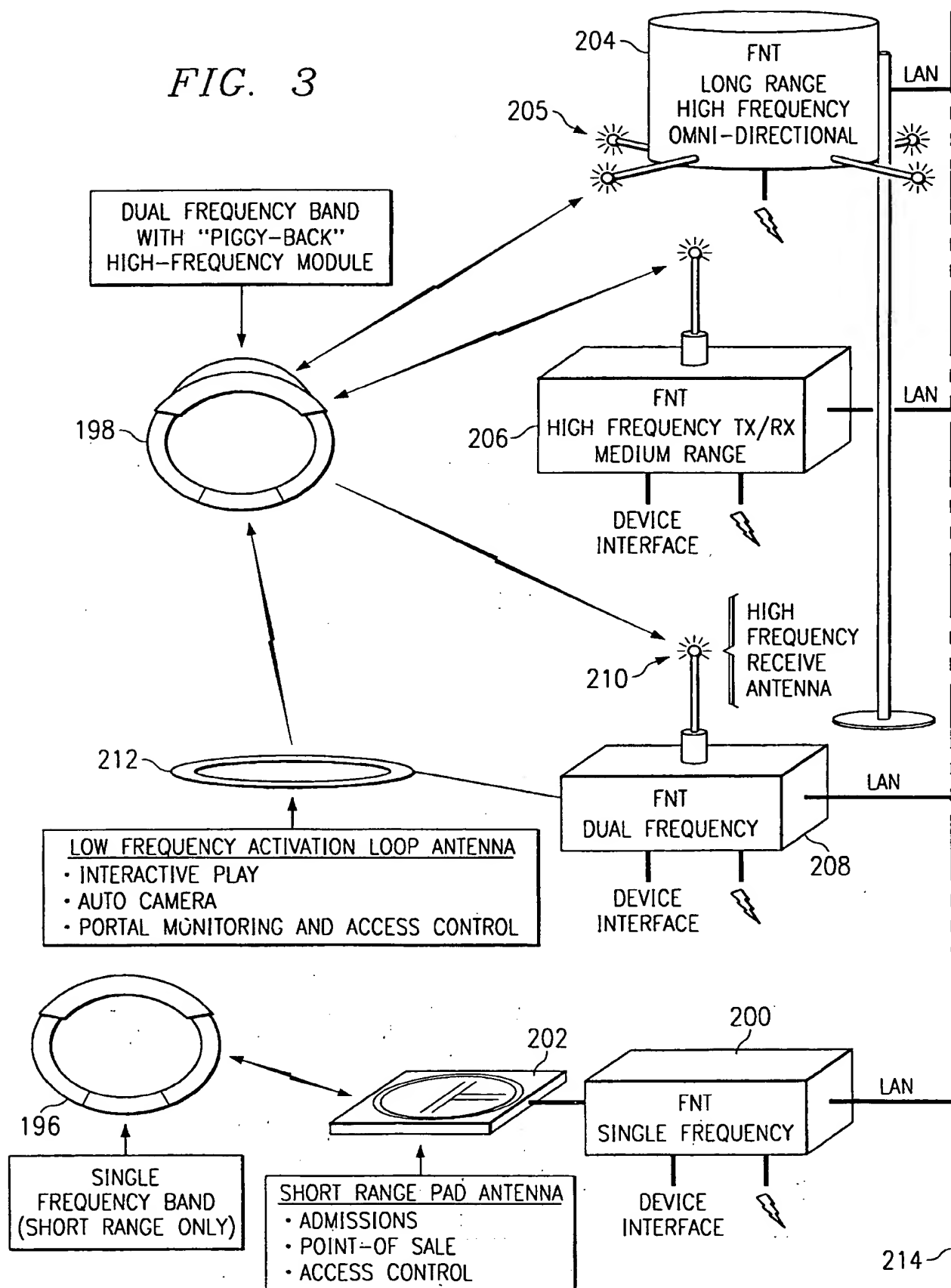


FIG. 2

3/3

FIG. 3



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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: METHOD AND SYSTEM FOR OPERATING AN AMUSEMENT PARK

(57) Abstract: An amusement or other park includes a radio frequency network having a plurality of long range and short range transceivers. The long range transceivers are geographically dispersed throughout the park. The short-range transceivers are located at transaction points within the park. The long-range transceivers are each operable to communicate with radio tags worn by persons in the park at long range. The short-range transceivers are each operable to communicate with radio tags at a short range. A park control system is coupled to the radio frequency network to receive from the long-range transceivers a long range response transmitted by a radio tag and to receive from the short-range transceivers a short range response transmitted by the radio tag and including a transaction having an identifier of the tag and an event associated with the tag. The park control system is operable to determine a location of the tag based on the long-range responses and to post a transaction to an account associated with the tag based on a financial transaction including the identifier of the tag and an amount.

WO 01/46916 A3

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/33569

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 G07C11/00 G06F17/60

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G07C G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 307 324 A (SIM LEONARD) 21 May 1997 (1997-05-21) abstract; claims; figures page 2, line 5 -page 12, line 32 page 13, line 19 -page 16, line 35 page 18, line 13 -page 23, line 13	48-50
Y		1-8,10, 11, 19-28, 30,36-39 12,13,17
A		
Y	US 5 966 654 A (CROUGHWELL WILLIAM J ET AL) 12 October 1999 (1999-10-12) cited in the application abstract; claims; figures column 13, line 11 -column 15, line 2 column 21, line 26 -column 23, line 42 --- -/-	1-6, 19-26, 36-39

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
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# INTERNATIONAL SEARCH REPORT

International Application No

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category "	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>WO 98 10358 A (GOLDBERG DAVID A) 12 March 1998 (1998-03-12)</p> <p>abstract; claims; figures page 2, line 12 -page 4, line 34 page 8, line 33 -page 10, line 30 ---</p>	<p>7,8,10, 11,27, 28,30</p>
A	<p>US 5 987 421 A (CHUANG CLIFF L) 16 November 1999 (1999-11-16) abstract; claims; figures column 2, line 42 -column 5, line 52 ---</p>	<p>1-39</p>
A	<p>BE 1 006 392 A (HEIJENS LUC) 9 August 1994 (1994-08-09) page 1, line 10 -page 8, line 11; claims; figures -----</p>	<p>1-39</p>

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 00/33569

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-39, 48-50

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-39, 48-50

A park with radio frequency network and a control system coupled to the radio frequency network, radio frequency tag used in the park, and method for operating the park

2. Claims: 40-47

Interactive play device and method for operating the interactive play device

3. Claims: 51-57

A visitation planning system

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/33569

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2307324 A	21-05-1997	EP 0958553 A WO 9718534 A JP 2000500934 T	24-11-1999 22-05-1997 25-01-2000
US 5966654 A	12-10-1999	AU 5153998 A WO 9820692 A	29-05-1998 14-05-1998
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